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NEW OR OTHERWISE INTERESTING PLANTS FROM INDIANA¹

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DURING the preparation of the treatments of *Carex* and the Juncaeeae for Deam's *Flora of Indiana* a number of new forms and of species not heretofore reported for the state have turned up and it has been found necessary to make several new combinations. It seems advisable to record these, together with a few novelties in other genera, as a group.

The following abbreviations for herbaria are used:

B—Bailey Hortorium.	K—R. M. Kriebel, Bedford, Ind.
Brk—Brooklyn Botanic Garden.	M—University of Michigan.
CA—California Academy of Sciences.	McK—Madge McKee, Goodland, Ind.
D—C. C. Deam, Bluffton, Ind.	N—U. S. National Herbarium.
Ek—C. M. Ek, Kokomo, Ind.	ND—Notre Dame University.
F—Field Museum.	NY—New York Botanical Garden.
G—Gray Herbarium.	P—Philadelphia Academy of Natural Sciences.
H—F. J. Hermann, Ann Arbor, Mich.	W—University of Wisconsin.

SCIRPUS ATROVIRENS Muhl., forma **proliferus**, forma nov. Spiculae nonnullae gemmis foliosis (1–5 cm. longis) basi bulbiformibus.—INDIANA: boggy slope on high bank of Little Vermillion River about 3 miles west of Newport, Vermillion County, *C. C. Deam*, no. 53,161, Sept. 19, 1932 (G—TYPE). MICHIGAN: marshy border of low woods, Cady's Corner, 5 miles southwest of Ypsilanti, Washtenaw County, *F. J. Hermann*, no. 8402, Sept. 29, 1936 (H; M; NY; P).

A similar form of *S. atrovirens* var. *georgianus* has been described by Marie-Victorin.²

¹ Paper from the Department of Botany of the University of Michigan no. 578 Printed at the expense of the Department to insure prompt publication.

² Contrib. Lab. Bot. Univ. Montreal 15: 267–268, f. 8. 1929.

CAREX SARTWELLII Dewey, var. **stenorrhyncha**, var. nov. Perigynium ellipticum, gradatim in rostrum longum attenuatum, 4–4.5 mm. longum, 1–1.3 mm. latum.—Marshy prairie east of Wolf Lake, north of Hammond, Lake County, *F. J. Hermann*, no. 6052, June 2, 1934 (G—TYPE); in prairie marsh south of Sheffield St. and west of Calumet Ave., 2 miles north of center of Hammond, Lake County, *C. C. Deam*, no. 53,920, June 24, 1933 (D).

In typical *C. Sartwellii* the perigynia are “ovate-orbicular, 2.5–3 mm. long, 1.25–1.75 mm. wide, abruptly contracted into a serrulate beak about one-fourth the length of the body.”¹ In var. *stenorrhyncha* the perigynia are very gradually long-beaked, elliptic in outline, from 4–4.5 mm. long and only 1–1.3 mm. wide.

In its long perigynia and narrow beak var. *stenorrhyncha* resembles the European *C. intermedia* Good. which Prof. Fernald informs me occurs in bogs or marshes of Ontario and Quebec. The variety of *C. Sartwellii* differs from *C. intermedia* in having the perigynia from elliptic to oblong-lanceolate or lanceolate, sessile to very short-stipitate, membranaceous, the body usually grading imperceptibly into the beak which is shallowly if at all bidentate (although strongly obliquely cut), and in having the pistillate scales largely hyaline. *C. intermedia* has ovate perigynia (1.75–2 mm. wide) which are stipitate, coriaceous and abruptly contracted into the deeply bidentate beak. The hyaline portion of the pistillate scales in *C. intermedia* is confined to a narrow margin; for the most part the scales are of a deep reddish-brown or coppery color which gives to the longer spikes of this species a shade much darker than those of the stramineous *C. Sartwellii* and its variety.

CAREX MESOCHOREA Mackenzie. In his most recent treatment of this species² Mackenzie apparently restricts its range to the region east of the Alleghenies. Material from seven stations in three counties of southern Indiana matches closely typical collections from New Jersey and Pennsylvania. The following collections are representative: grassy hillside 5 miles west of New Market, Montgomery County, *F. J. Hermann*, no. 6162, June 6, 1934 (CA; F; G; M; N; P) and *C. C. Deam*, no. 55,035, June 6, 1934 (D); grassy woodland near Harrodsburg, Monroe County, *R. M. Kriebel*, no. 2146, June 17, 1934 (H; K); pasture 2 miles south of Heltonville, Lawrence County, *R. M. Kriebel*, no. 3350, June 16, 1935 (K).

CAREX GRAVIDA Bailey, var. LUNELLIANA (Mack.) Hermann (Amer. Midl. Nat. 17: 855. 1936). Mackenzie, in *North American Flora*,

¹ Mackenzie in N. Amer. Fl. 18: 37. 1931.

² Mackenzie, l. c. 18: 51. 1931.

cites Illinois as the eastern limit of his *C. Lunelliana*. It is now known from three Indiana counties along the Illinois border: railroad siding 2 miles northwest of Earl Park, Benton County, *F. J. Hermann*, no. 6594, June 14, 1935 (Brk; CA; G; H); sandy roadside 4 miles south of Vincennes, Knox County, *C. C. Deam*, no. 56,130, June 14, 1935 (D); sandy soil 5 miles north of Terre Haute, Vigo County, *C. C. Deam*, no. 53,768, May 28, 1933 (D; H).

CAREX STIPATA Muhl., var. *MAXIMA* Chapm. (*C. uberior* (Mohr) Mack.) Kentucky and Missouri are given by Mackenzie as the northern limit of this sedge in the Mississippi Valley. The following Indiana collections are typical of *C. uberior*: swales, Chesterton, Porter County, *L. M. Umbach*, June 16, 1900 (D); woods $\frac{1}{4}$ mile south of Chestnut Ridge, Jackson County, *C. C. Deam*, no. 25,177, June 6, 1918 (D). Two collections (border of pond in woods 1 mile northeast of Romney, Tippecanoe County, *C. C. Deam*, no. 36,082, May 25, 1922 (D); boggy slope of terrace of Kissenger Ditch 2 miles east of Monroe, Knox County, *C. C. Deam*, no. 38,688, June 4, 1923 (D)) approach typical *C. stipata* although nearer *C. uberior*, while other intergrading forms, several of them exact intermediates, are so frequent in Indiana that it seems illogical to treat *C. uberior* as a species.

CAREX CUMULATA (Bailey) Mack. Known in Indiana only from a single collection by Miss Madge McKee: along a roadside ditch 3 miles northwest of Morocco, Newton County, July 4, 1936, no. 1743 (D) and 1744 (H; McK).

CAREX ARTITECTA Mack., var. **subtilirostris**, var. nov. Perigynii rostrum 1.75–2 mm. longum, spica mascula 11–16 mm. longa squamis haud appressis.—Wooded slope along a small creek about 3 miles northwest of Clinton, Vermillion County, *C. C. Deam*, no. 54,764, May 5, 1934 (G—TYPE; D).

Var. *subtilirostris* resembles *C. Emmonsii* Dewey in having the staminate scales ascending to loosely spreading, rather than closely appressed, and the midvein conspicuous to the tip of the scale, but the staminate spike is peduncled, longer and more conspicuous than in either *C. Emmonsii* or typical *C. artitecta*. The sheaths are more fibrillose than in the typical form and many of them purple-tinged to a length of 8 cm.; while in the typical form the coloration rarely extends more than 3 cm. above the base. The outstanding characteristic of var. *subtilirostris* is the extremely long perigynium-beak (1.75–2 mm. long, 1 mm. or less in the typical form) which often exceeds in length the body of the perigynium.

A collection from Tennessee, *J. K. Underwood*, no. 638, below Cherokee Orchard, Gatlinburg, Sevier County, April 29, 1934 (H), is tentatively referred here. It agrees well with the Indiana plant in its

long perigynium-beaks and long, conspicuous staminate spikes but the staminate scales are appressed, blunt and with shorter midrib.

CAREX WOODII Dewey. The aphyllopodic culms of this species of moist woodlands amply set it off from its relatives of meadows and prairies, *C. tetanica* Schkuhr and *C. Meadii* Dewey. It has not been reported from Indiana. Moist red and white oak woods, about 4 miles northwest of Valparaiso, Porter County, *C. C. Deam*, no. 44,400, June 2, 1927 (D); rich maple-beech woods, 1½ miles southeast of North Liberty, St. Joseph County, *C. C. Deam*, no. 54,861, May 23, 1934 (D; H) and *F. J. Hermann*, no. 6567, June 13, 1935 (CA; G; H).

CAREX STYLOFLEXA Buckley. A single collection from Indiana apparently represents the northwestern limit of the range of this species which has not been reported for the state: moist woods near Adams, Decatur County, *Mrs. C. C. Deam*, no. 8149, May 13, 1911 (D).

CAREX LAXIFLORA Lam., var. **serrulata**, var. nov. Bractearum vaginæ serrulatae; perigynia eis varietatis typicæ breviora latioraque.—INDIANA: in dry woods about 3 miles south of Garrett, DeKalb County, *C. C. Deam*, no. 3032, May 17, 1908 (D); in rich dry woods about 3 miles northwest of Upland, Grant County, *C. C. Deam*, no. 15,814, May 22, 1915 (D); on a beech slope about 7 miles northeast of Bloomington, Monroe County, *C. C. Deam*, no. 35,805, May 20, 1922 (D); wooded ravine 2 miles northwest of Henryville, Clark County, *C. C. Deam*, no. 6458 (G—TYPE). PENNSYLVANIA: oak-maple woods bordering Tinicum Creek, 1 mile northeast of Ottsville, Bucks County, *F. J. Hermann* no. 3443, July 12, 1932 (B); maple woods bordering Tinicum Creek, 1 mile southeast of Sundale, Bucks County, *F. J. Hermann*, no. 3487, July 12, 1932 (H).

The characters emphasized by Mackenzie for the separation of the *C. laxiflora* from the *C. blanda* group in his two latest treatments,¹ namely, the smooth bract-sheaths and the sterile culms reduced to tufts of leaves in *C. laxiflora* and its immediate allies and the ciliate-serrulate bract-sheaths and well-developed sterile culms in *C. blanda* and its allies, seem to be the most dependable yet offered for these complex groups. Of many hundreds of specimens in this series examined by the writer all have fallen readily into the categories as redefined by Mackenzie except for one repeatedly recurrent form here proposed as *C. laxiflora* var. *serrulata*. Its lack of sterile culms and merely oblique perigynium-beaks place it definitely with *C. laxiflora* but it possesses the ciliate-serrulate bract-sheaths characteristic of the *blanda* group. It resembles *C. albursina* in its broader, shorter

¹ In Small: Manual of Southeastern Flora, 198. 1933 and in N. Amer. Fl. 18: 244-245. 1935.

perigynia and in its tendency toward truncate pistillate scales but these are generally strongly awned although occasional specimens have them merely obtuse and apiculate or even acute. It is distinguished from *C. albursina* by its smaller, narrower bracts, conspicuous staminate spikes and longer, narrower basal leaves with the margins parallel, as well as in the lack of conspicuous sterile culms.

× CAREX **Deamii**, hybr. nov., *C. Shortiana* × *C. typhina*. *C. Shortianae* similis sed spicula latiora perigyniaque rostris longis.—Edge of low woods east of road dividing Sects. 17 and 18, Jefferson Twp., 2 miles southwest of Otwell, Pike County, *C. C. Deam*, no. 43,090, May 30, 1926 and no. 55,011, June 5, 1934 (D); *F. J. Hermann*, no. 6147, June 5, 1934 (D; F; G—TYPE; H; M; N; NY; P; and others).

Sterile; with the elongate spikes of *C. Shortiana* but these broader (7–8 mm. wide, in *C. Shortiana* 4–5 mm. wide); perigynia resembling those of *C. typhina* but more compressed, their beaks 1–1.5 mm. long (in *C. Shortiana* the beaks at most 0.2 mm. long).

A single large plant, in 1934 producing 46 flowering culms, was all that could be found of this distinctive hybrid. Closely associated with it were both the parent species.

CAREX RETRORSA Schwein. Mackenzie does not ascribe this species to Indiana in his monograph in *North American Flora*, and there are no recent reports of its occurrence in the state. No specimens could be found to support Schneck's report for the Lower Wabash Valley, Wilson's for Hamilton County or the report for Gibson County in Coulter's Catalogue. These localities are 120 to 230 miles south of the known range of the species and the reports were almost certainly based upon misidentifications. *C. retrorsa* is known, however, from two collections from the northern border of Indiana: edge of swamp, East Chicago, Lake County, *W. S. Moffatt*, July 2, 1893 (W); near St. Mary's Academy, Notre Dame, St. Joseph County, *J. A. Nieuwland*, July 9, 1913 (ND).

JUNCUS GERARDI Loisel. Peattie¹ reported this rush of the salt marshes of the Atlantic Coast from Indiana Harbor, Lake County, but attempts to locate a specimen from this locality have not been successful. In 1935, however, the species was discovered to be well established on dry open ground along the Nickle Plate Railroad 4 miles east of Kokomo, Howard County, by Mr. C. M. Ek, and the following collections from this station have been distributed: *C. M. Ek*, July 20, 1935 (Ek; H; NY); *C. C. Deam*, no. 57,045, June 28, 1936 (D; H).

JUNCUS MACER S. F. Gray, forma **anthelatus** (Wiegand), comb. nov. (*J. tenuis* var. *anthelatus* Wiegand, Bull. Torrey Bot. Club 27: 523. 1900).

¹ *Flora Ind. Dunes*, 113. 1930.

This common form of the ubiquitous *J. macer* does not have, so far as the writer can detect, a geographic range distinct from that of the species, and its preference for wetter habitats than those of the species suggests that it is an ecological variant. To accord with the concept of the categories now prevalent, therefore, it would be better treated as a form.

JUNCUS MACER S. F. Gray, forma **discretiflorus**, forma nov. F. *anthelato* similis sed inflorescentiae rami pauci- et sparsiflori, multifere longissimi uniflorique; sepala attenuato-subulata petalis longiora; fructus sepalis plerumque dimidio brevior.—Moist hard clay soil along road 1 mile north of Belmont, Brown County, *C. C. Deam*, no. 43,472; June 18, 1926 (D); low place along the Southern Railroad about 1 mile east of Mt. Carmel [Ill.], Gibson County, *C. C. Deam*, no. 25,489 (D); base of washed beech slope about 1½ miles west of Stanford, Greene County, *C. C. Deam*, no. 26,086 (D); buttonbush swamp on top of the highest ridge of the county about two miles north of Mauckport, Harrison County, *C. C. Deam*, no. 56,381, July 13, 1935 (D; G—TYPE); along a small creek 1 mile southeast of Kurtz, Jackson County, *C. C. Deam*, no. 38,924, June 28, 1923 (D); along a wood-road 3 miles northwest of Shoals, Martin County, *C. C. Deam*, no. 28,176, July 16, 1919 (D).

This is a tall form resembling f. *anthelatus* but it is slender, often lax, and has a more diffuse inflorescence. The ultimate branches of the inflorescence are longer, frequently up to 7 cm., the flowers few to a branch, scattered and widely separate, the sepals attenuate-subulate and generally conspicuously longer than the petals, and the capsule typically about half the length of the sepals. The presence of several to many long filiform branches bearing only a single, terminal flower is usually a prominent characteristic of the inflorescence. In f. *anthelatus* the ultimate floriferous branches are rarely over 4 cm. long, the sepals and petals are generally subequal and the capsule averages three-fourths the length of the sepals.

The specimens of f. *discretiflorus* so far seen are all from the southern third of Indiana but the plant has so much the aspect of an ecological phase that a formal rather than a varietal designation of it seems more logical.

JUNCUS MACER S. F. Gray, f. **Williamsii** (Fernald), comb. nov. (*J. tenuis* var. *Williamsii* Fernald, RHODORA 3: 60. 1901).—Marshes near Calumet River, Whiting, Lake County, *F. W. Johnson*, no. 1413, July 21, 1913 (F); path north of North Twin Lake, 2 miles west of Howe, Lagrange County, *C. C. Deam*, no. 54,422, Aug. 27, 1933 (D); in meadow and along ditch, 1 mile north of Mitchell, Lawrence

County, *R. M. Kriebel*, no. 3449, June 26, 1935 (K); Newton County, *Madge McKee* in 1935 (McK).

The accumulation of numerous specimens since the original description of *J. tenuis* var. *Williamsii* was published reveals that it is not confined to the eastern states as was then supposed. Material from practically all of the central states has been seen and apparently, like *f. anthelatus*, it is to be found sporadically throughout most of the range of the species so may appropriately be treated as a form.

JUNCUS SECUNDUS Beauv. This eastern species was reported for Putnam County by Wilson¹ but a search for specimens to substantiate his report has been unsuccessful and since other species of §*Poiophylli* are frequently confused with *J. secundus* this record is open to question. The species is now definitely known, however, from Washington County: wet clay fallow field 3 miles east of Livonia, *F. J. Hermann*, no. 6705, June 17, 1935 (D; G; H).

LUZULA CAMPESTRIS VAR. **MULTIFLORA** AND ITS ALLIES.—All material of this group of *Luzula* in Indiana herbaria was found to be referred to either *L. campestris* var. *multiflora* or *L. campestris* var. *bulbosa*. This disposition of the collections resulted in a patently heterogenous grouping, and even after a series from the southern counties, clearly matching authentic material from the coastal plain of var. *echinata*, had been removed the remaining alignment was but little improved. Earlier field studies of vars. *multiflora* and *echinata* in Pennsylvania and New Jersey, where their ranges overlap, had suggested that vegetative and other gross morphologic distinctions between the two had not been sufficiently emphasized and that they were perhaps after all specifically distinct; indeed, no transitional forms between mature fruiting plants of the two could be found in the field. Further work in the herbarium strengthened this view, and a careful comparison of American and European specimens of var. *multiflora* with the rhizomatous *L. campestris* of Europe led the writer to agree with Lange,¹ Lindman,² Holm,³ Vierhapper⁴ and other authors that *L. multiflora* is a specific entity. With both *L. echinata* and *L. multiflora* considered as species, and with forms of var. *bulbosa* approaching *L. multiflora* the Indiana problem became less complex. Still the widespread plant of central and southern Indiana could not be made to key out to any of the varieties in Fernald and Wiegand's

¹ *Conspect. Fl. Groenl.* 125. 1880.

² *Svensk Fanerogamflora*, 157. 1918.

³ *RHODORA* 28: 133-135. 1926.

⁴ In Engler: *Pflanzenfam.* 15a: 224. 1930.

revision of the group.¹ Its affinities were manifestly with *L. echinata*, with which it frequently intergrades, and it is here proposed as an inland variety of the coastal plain species. With this alignment all the Indiana material seems to fall naturally into four groups and their distribution within the state (maps 1-4) assumes definite geographic significance. The following key is an attempt to indicate the principal characters upon which the two species and their varieties, as they occur in Indiana, may be separated.

- Rays of umbel erect or ascending, relatively stout; heads mostly cylindric
 Cauline leaves large, 9 (7)-14 cm. long, 4-6 (9) mm. wide; filaments equaling the anthers; perianth averaging 3 mm. long, usually slightly exceeding the capsule; heads pale; bulbs rarely present. *L. multiflora*.
 Cauline leaves small, 3-5.5 cm. long, 2-3 mm. wide; filaments shorter than the anthers; perianth averaging 2.5 mm. long, shorter than the capsule; heads dark; bulbs usually present. *L. multiflora* var. *bulbosa*.
 Rays of umbel mostly strongly divergent, some elongate and filiform; heads hemispheric or short-cylindric; leaves mostly clustered at base of plant, the cauline small, 2-7 cm. long, 1.5-3 mm. wide.
 Filaments one-half the length of the anthers or less; perianth conspicuously exceeding the capsule, generally 3 mm. or more long. *L. echinata*.
 Filaments more than one-half the length of the anthers; perianth from shorter than to slightly exceeding the capsule, generally about 2.5 mm. long. *L. echinata* var. *mesochorea*.

LUZULA MULTIFLORA (Ehrh.) Lejeune. (*L. campestris* var. *multiflora* (Ehrh.) Čelak.). In Indiana confined to the lake area. Chiefly in clayey or gravelly soils.

LUZULA MULTIFLORA (Ehrh.) Lejeune, var. **bulbosa** (Wood), comb. nov. (*L. campestris* var. *bulbosa* Wood, Class Book, 723. 1861). Represented only from the northwestern counties, all within the lake or prairies areas, where its habitat, very sandy open oak woods, is common.

LUZULA echinata (Small), comb. nov. (*Juncooides echinatum* Small in *Torreyia* 1: 74. 1901). Confined to approximately the southern third of the state; most frequent in the "knob" area.

LUZULA ECHINATA (Small) Hermann, var. **mesochorea**, var. nov. Filamenta antheris ca. $\frac{1}{3}$ breviora; sepala petalaeque fructu aut breviora aut vix longiora, plerumque 2.5 mm. longa.—Dry open woods, especially white oak, throughout Indiana except in the lake area; doubtless occurring also in at least Ohio, Kentucky and Illinois. The following are among the 54 Indiana collections which were examined. Beech-tulip tree woods, 7 miles south of Columbus, Bartholomew County, *C. C. Deam*, no. 23,162, May 27, 1917 (D); dry woods about 1

¹ RHODORA 15: 40. 1913.



Distribution in Indiana of (1) *LUZULA MULTIFLORA*, (2) *L. MULTIFLORA* var. *BULBOSA*, (3) *L. ECHINATA*, (4) *L. ECHINATA* var. *MESOCHOREA*.

mile south of Hamburg, Brown County, *C. C. Deam*, no. 6576, June 5, 1910 (G—TYPE); black-white oak woods, 2½ miles southeast of Lake Cicott, Cass County, *C. C. Deam*, no. 54,795, May 11, 1934 (D; H); black-white oak woods ½ mile west of Epsom, Daviess County, *C. C. Deam*, no. 42,825, May 19, 1926 (H); white oak woods ¾ miles south of Weisburg, Dearborn County, *C. C. Deam*, no. 27,844, May 19, 1919 (D); dry white oak woods about 5 miles northwest of Upland, Grant County, *C. C. Deam*, no. 15,781, May 22, 1915 (D); oak knob, 1½ miles southwest of Heltonville, Lawrence County, *F. J. Hermann*, no. 6160, June 5, 1934 (G; H); common on a beech slope about 6 miles northeast of Bloomington, Monroe County, *C. C. Deam*, no. 44,005, April 17, 1927 (D); woods 7.7 miles east of the Spencer-Perry County line, north side of road 62, Perry County, *R. C. Friesner* no. 8666, May 12, 1935 (Butler Univ.; H); open woods ½ mile east of Lexington, Scott County, *C. C. Deam*, no. 40,128, May 12, 1924 (D); hard clay soil in clearing 4 miles northwest of Chrisney, Spencer County, *F. J. Hermann*, no. 6138, June 4, 1934 (G; H); dry beech woods about 1 mile northwest of Hillsdale, Vermillion County, *C. C. Deam*, no. 5838A, May 8, 1910 (D).

EUPATORIUM SEROTINUM Michx., var. **polyneuron**, var. nov., a var. typica differt foliis (oppositis vel ternatis) sessilibus, multinerviis basin versus integris, achaeniis 2.25–4 mm. longis.—Grassy clearing in low cut-over woods 2 miles northeast of Hanover, Jefferson County, *C. C. Deam*, no. 56,851, Sept. 23, 1935 (D; F; G—TYPE; H; N; NY; P), and no. 57,424, Sept. 23, 1936 (D; H; M; W); *F. J. Hermann*, no. 6768½, Sept. 22, 1935 (H).

The colony of this striking form of *Eupatorium serotinum* was discovered by Miss Edna Banta who showed it to Mr. Deam and the writer in the field. Plants of it were dug on June 19, 1935 and transferred to the Deam Garden at Bluffton and the University of Michigan Botanical Gardens from which the above collections were made during the flowering period. The original habitat is in the Illinoian Drift area on a hard white clay soil in an area wooded chiefly with beech, red gum, pin oak and some black oak. In grassy clearings in this cut-over woods a notable associate of the *Eupatorium* is *Eleocharis Wolfii*, this being the only known station for the *Eleocharis* in Indiana.

The cuneate bases of the sessile, many-nerved, usually opposite but occasionally ternate, leaves of var. *polyneuron* are entire; the involucre bracts tend to be more elongate, less blunt and less puberulent than in the typical plant; and the achenes are longer on the average (in typical *serotinum* generally less than 2 mm. long, averaging about 1.75 mm., in var. *polyneuron* varying from 2.25 (rarely only 2)–4 mm. long).

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